W91321-04-C-0023

LOGANEnergy Corp.

US Army Schofield Barracks, HI PEM Demonstration Project
Final Project Report

Proton Exchange Membrane (PEM) Fuel Cell Demonstration
Of Domestically Produced PEM Fuel Cells in Military Facilities

US Army Corps of Engineers
Engineer Research and Development Center
Construction Engineering Research Laboratory
Broad Agency Announcement CERL-BAA-FY03

US Army Schofield Barracks Fire Station

August 22, 2006

Executive Summary

Under terms of its FY'03 DOD Proton Exchange Membrane (PEM) Demonstration Contract with ERDC/CERL, LOGANEnergy installed a 5kWe Plug Power GenSys5P PEM fuel cell power plant at US Army Schofield Barracks, HI fire station. This site was selected during a base tour with Schofield Barracks representatives during a visit on September 8, 2004.

The installation combined both grid parallel/grid independent electrical configurations to support the power requirements of the fire station. The unit was also thermally integrated with the fire station's hot water heater in order to transfer fuel cell process heat to the fire station's hot water tank.

Hawaii Electric serves Schofield Barracks with a rate of $0.13/kWH. The Gas Company provided Liquid Propane Gas (LPG) for the project, supplying project fuel at $1.00 per gallon. The project added an additional $1,042 energy costs to the base during the period of performance.

The project first start occurred on Dec 8, 2004, and was officially commissioned on that same date. Schofield representatives were very enthusiastic and supportive of the project from the beginning and expressed interest in a follow on project opportunity.

The site acceptance test occurred on May 13, 2005 and was attended by Schofield, CERL and LOGANEnergy representatives and visitors from The Gas Company. The unit performed normally during the test and the site inspection confirmed the installation followed the project plan.

The base POC for this project was Keith Yamanaka who may be reached at:
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Proposal – Proton Exchange Membrane (PEM) Fuel Cell Demonstration of Domestically Produced Residential PEM Fuel Cells in Military Facilities

1.0 Descriptive Title

LOGANEnergy Corp. Small Scale PEM 2003 Demonstration Project at US Army Schofield Barracks, Hawaii.

2.0 Name, Address and Related Company Information

LOGANEnergy Corporation

1080 Holcomb Bridge Road
BLDG 100- 175
Roswell, GA 30076
(770) 650- 6388

DUNS 01-562-6211
CAGE Code 09QC3
TIN 58-2292769

LOGANEnergy Corporation is a private Fuel Cell Energy Services company founded in 1994. LOGAN specializes in planning, developing, and maintaining fuel cell projects. In addition, the company works closely with manufacturers to implement their product commercialization strategies. Over the past decade, LOGAN has analyzed hundreds of fuel cell applications. The company has acquired technical skills and expertise by designing, installing and operating over 60 commercial and small-scale fuel cell projects aggregating over 7 megawatts of capacity. These services have been provided to the Department of Defense, fuel cell manufacturers, utilities, and other commercial customers. Presently, LOGAN supports 30 Phosphoric Acid Fuel Cells (PAFC) and PEM fuel cell projects at 21 locations in 15 states, and has agreements to install 22 new projects in the US, Iceland and the UK over the next 12 months.

3.0 Production Capability of the Manufacturer

Plug Power manufactures a line of PEM fuel cell products at its production facility in Latham, NY. The facility produces three lines of PEM products including the 5kW GenSys5C natural gas unit, the GenSys5P Liquid Propane Gas (LPG) unit, and the GenCore 5kW standby power system. The current facility has the capability of manufacturing 10,000 units annually. Plug Power will support this project by providing remote monitoring, telephonic field support, overnight parts supply, and customer support. These services are intended to enhance the reliability and performance of the unit and achieve the highest possible customer satisfaction. Vinny Cassala is the Plug Power point of contact for this project. His phone number is 518.782.7700 ex1228, and his email address is vincent_cassala@plugpower.com.

4.0 Principal Investigator(s)

Name	Samuel Logan, Jr.	Keith Spitznagel
Title	President	Vice President Market Engagement
Company	Logan Energy Corp.	Logan Energy Corp.
Phone	770.650.6388 x 101	860.210.8050
Fax	770.650.7317	770.650.7317
Email	samlogan@loganenergy.com	kspitznagel@loganenergy.com

5.0 Authorized Negotiator(s)

Name	Samuel Logan, Jr.	Chris Davis
Title	President	Vice President Operations
Company	Logan Energy Corp.	Logan Energy Corp.
Phone	770.650.6388 x 101	770.650.6388 x102
Fax	770.650.7317	770.650.7317
Email	samlogan@loganenergy.com	cdavis@loganenergy.com

Name	Keith Spitznagel
Title	Vice President Market Engagement
Company	Logan Energy Corp.
Phone	724.449.4668
Fax	770.650.7317
Email	kspitznagel@loganenergy.com

6.0 Past Relevant Performance Information

a) Contract: PC25 Fuel Cell Service and Maintenance Contract #X1237022

Merck & Company
Ms. Stephanie Chapman
Merck & Company
Bldg 53 Northside
Linden Ave. Gate
Linden, NJ 07036
(732) 594-1686

Contract: Four-year PC25 PM Services Maintenance Agreement.
In November 2002 Merck & Company issued a four-year contract to LOGAN to provide fuel cell service, maintenance and operational support for one PC25C fuel cell installed at their Rahway, NJ plant. During the contract period the power plant has operated at 94% availability.

b) Contract: Plug Power Service and Maintenance Agreement to support one 5kWe GenSys 5C and one 5kWe GenSys 5P PEM power plant at NAS Patuxant River, MD. .

Plug Power
Mr. Vinny Cassala
968 Albany Shaker Rd.
Latham, NY 12110
(518) 782-7700 ex. 1228

LOGAN performed the start-up of both units after Southern Maryland Electric Cooperative completed most of the installation work and continues to provide service and maintenance during the period of performance.

c) Contract: A Partners LLC Commercial Fuel Cell Project Design, Installation and 5-year service and maintenance agreement.
Contract # A Partners LLC, 12/31/01

Mr. Ron Allison
A Partner LLC
1171 Fulton Mall
Fresno, CA 93721
(559) 233-3262

On April 20, 2004 LOGAN completed the installation of a 600kWe PC25C Combined Heat and Power (CHP) fuel cell installation in Fresno, CA. The fuel cells also provide low-grade waste heat at 140 degrees F that furnishes thermal energy to 98 water source heat pumps located throughout the 12-story building during the winter months.

7.0 Host Facility Information

Picture of US Army Schofield Barracks under attack Dec 7, 1941.

In 1872, Major General John M. Schofield, Commanding General of the US Army's Pacific Division, visited the Hawaiian Islands to determine the defense capabilities of its ports. He concluded that a harbor could be formed at the mouth of the Pearl River and that it could be easily defended. After the 1898 annexation of Hawaii by the United States, military forces started moving to the islands. In April 1909, the War Department renamed the post to Schofield Barracks from the name most often used in the area, "Castner Village".

The Secretary of War approved plans for construction and troop build-up at Schofield Barracks in 1911. The plans called for five infantry regiments, and one each of cavalry and field artillery. Those plans were later altered but permanent quarters were needed for the four regiments already on post. The first permanent structures on post, which still exist today, were the quadrangle barracks.

When all of Schofield's troops were called to war in 1917 the Hawaiian National Guard moved in and after the Armistice was signed in November 1918 they began beautifying the post. The National Guard planted many of the large trees seen on Schofield Barracks, including the Norfolk Pines. Construction that was postponed during the war was resumed in the early 1920's. An extension of the Oahu Railway and Land Company railroad was built to pass in front of the quads.

Construction in the 1930's reflected a style called art decor, characterized by its round edges. Also in the 1930's, many of Schofield's fields and streets were named to commemorate outstanding military leaders including Generals Henry Butner and Harry Bishop, Colonels Wright Smith and George Stoneman and Lieutenants William Sills and Guy Benson.

Up until and during the Korean War, Schofield Barracks facilities were under utilized while mainland facilities were overrun with draftees. In 1951, a basic training center was

established for replacement troops. The 25th Infantry returned to Hawaii in 1954 to add to the population of Schofield Barracks. The additional troops and families presented a demand for more facilities to include a new commissary, noncommissioned officers' club and the first elementary school.

During the Vietnam Conflict, the barracks were so under utilized that they were remodeled to form semi-private rooms. In the 1970's, upgrades of facilities could be seen all over Schofield Barracks to include commissary, youth and child-care, and restaurant facilities. The post stockade was closed in 1977 and was used as a Correctional Custody Facility until November 1990. H-2, the highway connecting Schofield Barracks to Honolulu, was also completed in 1977.

By the early 1980's, Schofield Barracks was well populated and the largest post operated by the US Army outside the continental United States. Today, Schofield Barracks is a well-maintained and self-contained Army community. The electric service provider is Hawaii Electric and the LPGas Service provider is Hawaii Gas. The map pictured at right, Figure 1, indicates the location of Schofield Barracks relative to other geographic areas and points of interest on the island of Oahu, HI.

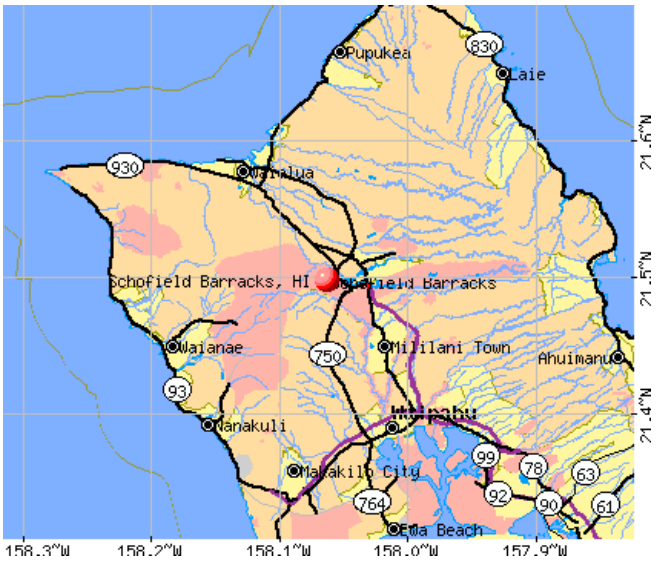


Figure 1

8.0 Fuel Cell Site Description and Fuel Supply

The photo at right, Figure 2, shows the front elevation of the Schofield Barracks fire station. This site became the consensus favorite after LOGAN and Schofield representatives toured the base. From the outset the fire chief expressed great enthusiasm in hosting the project, and the site itself, provided a good opportunity to install and display the fuel cell to good effect.

Figure 2 Front elevation of the fire station

Figure 3 at left shows the fuel cell sitting on its pad at the rear of the fire station. Since natural gas was not available at this site in Hawaii, LOGAN selected an LPGas unit for this project. The 250-gallon LPGas fuel tank, pictured immediately below in Figure 4 provided fuel storage for the project and was positioned approximately 25 feet away from the fuel cell.

Figure 3

While operating at a set point of 2.5kW, the GenSys5P fuel cell consumes .53 gallons of LPGas per hour. This equates to 20% electrical efficiency, which is low by conventional power generation standards. However, this is a first generation LPGas fuel cell, and more importantly the project provided the opportunity to demonstrate that the product could achieve its design and performance specifications and also achieve 90% availability as required under the demonstration protocol.

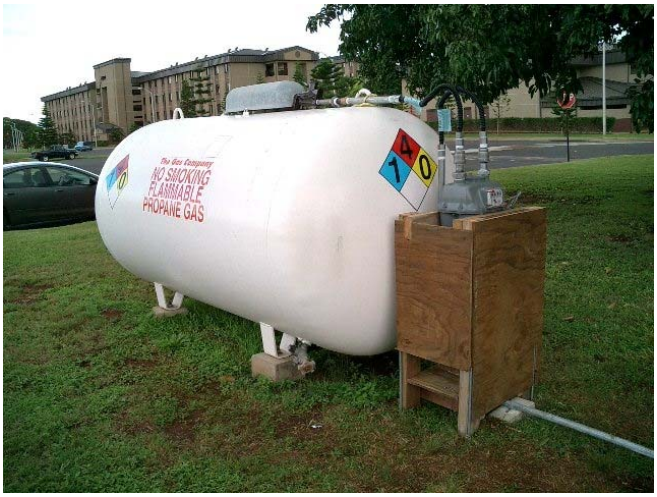


Figure 4

LOGAN processed a digging permit prior to beginning site work. No other permits were required at this site.

Figure 5 May 13, 2005 Photo of Acceptance Test Attendees

9.0 Electrical System

Figure 6

Figure 7

The Plug Power GenSys5P PEM fuel cell power plant provides both gird parallel and grid independent operating configurations. This dual capability is an important milestone in the development of the GenSys5 product and for the PEM Program itself, as it is a significant developmental step on the pathway to product commercialization. The unit has a power output of 110/120 VAC at 60 Hz, and when necessary the voltage can be adjusted to 208vac depending upon actual site conditions. The photo above left, Figure 6, shows the electrical service panel in at the rear entrance to the fire Station, which provided the point of electric service entry to the facility. The fuel cell grid parallel conductor was wired to this panel at a spare 60-amp circuit breaker providing 45 amps electrical service to facility loads. In addition, LOGAN installed a new fuel cell emergency panel, pictured above left in Figure 7, inside the fire station office, in order to support computer server, communications, and emergency lighting loads within the facility. Note the station UPS wired into the emergency panel (white box seen in Figure 7). Had there been a utility grid failure during the test period, the fuel cell would have provided power to these circuits. However, there were no service interruptions during the project

10.0 Thermal Recovery System

While operating at a power set point of 2.5kW, the GenSys5P circulates 8,000Btu/H of 140 degree F hot water through a customer heat exchanger. If there is no demand for heat, the unit rejects process heat through an air-cooled radiator. In order to capture this thermal energy and provide it to the fire station, LOGAN installed a Heliodyne heat exchanger to transfer fuel cell process heat to the existing hot water heater, pictured in Figure 8 below.

The Heliodyne is a “U” shaped coil within a coil design that provides double wall protection between the heat source and the heat sink. It was designed primarily for the solar heating industry, but has proved to be very adaptable to the fuel cell industry as well. The Heliodyne was placed on the fire station near the water heater. It has its own

pump that circulates the water tank in a counter flow against incoming hot water provided by the fuel cell's heat exchanger. While this method of waste heat recovery, typically, has a low load factor, the demonstration provided an opportunity to evaluate the effectiveness of the heat transfer system and refine installation methods.

Figure 8

11.0 Data Acquisition System

In order to monitor the fuel cell and capture/trend performance data, LOGAN installed a Connected Energy Corporation (CEC) web based Supervisory Control And Data Acquisition (SCADA) system that connects to a local Internet Service Provider (ISP). The schematic drawing seen below in Figure 9 describes the architecture of the Terminal Unit hardware that supports the project. The system provides a comprehensive data acquisition solution and also incorporates remote control, alarming, notification, and reporting functions. The system captures and displays a number of fuel cell operating parameters on functional screens including kWh, cell stack voltage, and water management, as well as external instrumentation inputs including Btu transfer, fuel flow, and thermal loop temperatures.

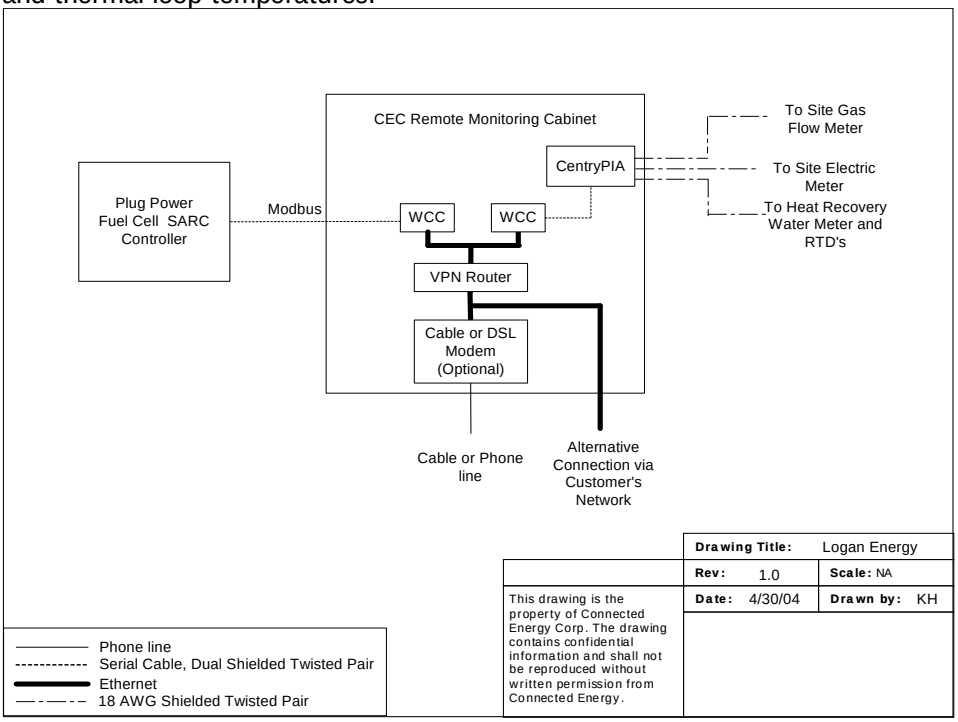


Figure 9, CEC WEB enabled SCADA terminal hardware.

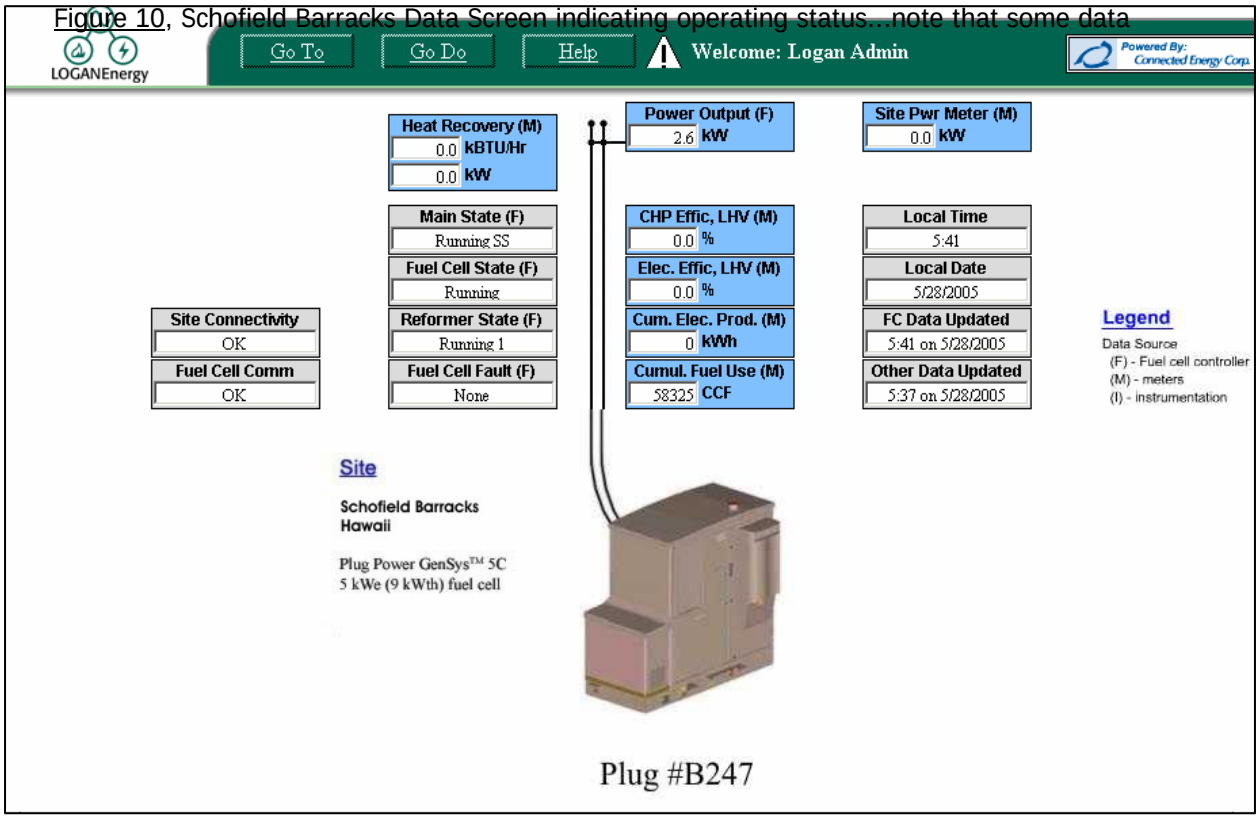
With the installation of this system at the Schofield Barracks project, LOGAN continued to learn new lessons in Web based Combined Heat and Power (CHP) resource management. The web communications interface at the fire station was provided by a local ISP.

LOGANEnergy's Operations Control Center in Rochester, New York, collects, stores, displays, alarms, archives site data, and maintains connectivity by means of a Virtual Private Network (VPN) link to the fuel cell.

Figure 10, on page 12, is an example of one of many data screens that are maintained by the CEC system and displayed on the web. Due to the problem described above the screen provided only incomplete data in the data display boxes. A sample data graph is also attached to Appendix 2 providing kWh and fuel flow.

To view the operation of this unit online, please open your browser to:
https://www.enerview.com/EnerView/login.asp
Then login as: Logan. user and enter password: guest. Select within the Pacific Region the location labeled Schofield Barracks then you may navigate the site or other LOGAN sites using the tool bars or html keys.

Figure 10, Schofield Barracks Data Screen indicating operating status…note that some data



boxes are not recording due to the service issues described above.

12.0 Program Costs

US Army Scofield Barracks, Honolulu, HI		
1) Water (per 1,000 gallons)	$	0.85
2) Utility (per KWH)	$	0.130
3) LPGas (per gallon)	$	1.00

First Cost	**Estimated**	**Actual**	**Variance**
Plug Power 5 kW SU-1	$ 75,000	$ 75,000	$ -
Shipping	$ 4,800	$ 1,750	$ (3,050)
Installation electrical	$ 4,875	$ 5,351	$ 476
Installation mechanical, LPGas & thermal	$ 13,205	$ 8,946	$ (4,259)
Web Package	$ 5,200	$ 8,770	$ 3,570
Site Prep, labor materials	$ 375	$ 941	$ 566
Training	$ 2,000		$ (2,000)
Lodging and Perdiem		$ 2,461	$ 2,461
Technical Supervision/Start-up	$ 3,000	$ 4,500	$ 1,500
Total	**$ 108,455**	**$ 107,719**	**$ (736)**
Assume Five Year Simple Payback	$ 21,691	$ 21,544	$ (147)

Forcast Operating Expenses	Vol/hr	$/Hr	$/ Yr	
LPGas gallons	0.5300	$ 0.53	$ 4,178.52	
Water Gallons per Year	14,016		$ 11.91	
Total Annual Operating Cost				$ 4,190.43

Economic Summary			
Forcast Annual kWH		19710	
Annual Cost of Operating Power Plant	$	0.213	kWH
Credit Annual Thermal Recovery Rate		($0.0297)	kWH
Project Net Operating Cost	$	0.183	kWH
Displaced Utility cost	$	0.130	kWH
Energy Savings (Cost)		($0.053)	kWH
Annual Energy Savings (Cost)		($1,042.72)	

Explanation of Calculations:

Actual First Cost Total is a *sum* of all the listed first cost installation tasks and components.
Assumed Five Year Simple Payback is the Estimated First Cost Total *divided by* 5 years.
Forecast Operating Expenses:

LPGas usage in a fuel cell system set at 2.5 kW will consume 0.53 gallons LPGas per hour. The cost per hour is 0.53 gallons per hour *x* the cost of LPGas to the site. The LPGas cost at this site is *$1.00/ gallon*.

GenSys fuel cell systems set at 2.5 kW will consume 1.6 gallons of water per hour through the De-Ionization (DI) panel. The estimated volume of water consumed at 14,016 gallons per year is 1.6 gph *x* 8760 hours per year. The cost per year at $11.91 is 14,016 gph *x* cost of water to the site at $12.13 per 1000 gallons.

The Total Annual Operating Cost, $4,190 is the *sum of* the cost per year for fuel and the cost per year for the water consumption.

Economic Summary:

The Forecast Annual kWh at 19,710 kWh is the product of 2.5 kW set-point for the fuel cell system *x* 8760 hours per year *x* 0.9. The 0.9 is for 90% estimated availability.
The Annual Cost of Operating the Power Plant at $0.213 per kWH is the Total Annual Operating Cost of $4,190 *divided by* the forecast annual kWh of 19,710 kWh.
The Credit Annual Thermal Recovery at -$0.029/kWh is 7800 *divided by* 3414. This is then *multiplied by* 0.9 *x* 0.1 *x* the cost of electricity at $0.1300 per kWh *x* (-1). As a credit to the cost summary, the value is expressed as a negative number.
The Project Net Operating Cost is the *sum* of the Annual Cost of Operating the Power Plant *plus* the Credit Annual Thermal Recovery. In this case the fuel cell operating cost of $0.183/kWh is $0.053/kWh more per kWh than the competitive grid rate of $0.13/kWh. As a result the project projects a net energy cost increase to the base of $1,042.
The Displaced Utility Cost is the cost of electricity to Kaneohe Bay per kWh.

Energy Savings (cost) equals the Displaced Utility Cost *minus* the Project Net Operating Cost.

Annual Energy Savings (cost) equals the Energy Savings (cost) *x* the Forecast Annual kWh.

13.0 Difficulties Encountered

The CEC web SCADA system requires very precise signals from the instrumentation outputs. The gas meters, watt meters, flow meters and thermal elements invariably require signal strength adjustment to insure that their discrete inputs are readable by the terminal unit. Discovering the proper voltage range required for each signal loop is most often achieved by trial and error, requiring multiple site visits to establish a readable connection. At this particular site LOGAN discovered that these devices required high levels of maintenance and/or replacement to support continuous data collection. The humid oceanic climatic conditions in Hawaii exposed LOGAN to a new set of functional issues that provided new learning experiences but one that was not satisfactorily overcome during the project demonstration period

Despite numerous attempts to solve the problems encountered, LOGAN was able to retrieve only intermittent data during 12 months of operation.

14.0 Milestones/Improvements

In achieving 96% availability, the Schofield fuel cell achieved a solid performance for an early LPGas field test. This is LOGAN's second LPGas unit to complete the one year test cycle and as with the Cherry Point project, which achieved 99% availability, this unit has exceeded performance requirements.

15.0 Decommissioning/Removal/Site Restoration

The Plug Power SU-1 S/N 247 has been removed from the site, and the LPGas tank and piping have been removed as well. The site is fully decommissioned and restored to original condition in accordance with the facility's requirements. The unit was donated to the University of Hawaii Fuel Cell Center where it will be used as an educational tool.

16.0 Additional Research/Analysis

No additional research was performed at this site.

17.0 Conclusions/Summary

This PEM demonstration project has been a great success story for CERL, Schofield Barracks, Plug Power and LOGAN. Although S/N247 was one of the latest of approximately 350 units in the SU-1 design series, leading one to expect a high performance level for that reason; the fact that this LPGas unit achieved 96% availability is exceptionally gratifying to the program. Its strong performance record must be considered an important product and programmatic milestone.

The unit operated at an average 2.5 kW (e) output over the course of 12.5 months. It produced 21,543 kWh in 9942 operating hours. Actual program costs came in right at the budgeted amount

The installation plan was well conceived, but not anymore so than the 60 other PEM sites developed by LOGAN over the pasts 5 years. However this site proved to be more challenging to support and maintain than most other sites due to its Hawaiian location. Shipping distances complicated timely parts supply and time zone differences complicated communications with on-island support. Fortunately the strong performance of S/N247 mitigated the potential adverse effects of these logistical issues.

In summary, the lessons learned at this site will have positive implications for future PEM operations and customer services. As these experiences are transferred to future installations they will directly benefit the community of CERL projects and equally enhance the reliability of future Plug Power products. The project elevated the awareness of fuel cell technology at Schofield Barracks, educated the local community, and advanced the broader objectives of the fuel cell industry and near term product commercialization.

Appendix

1. Monthly Performance Data

Figure 11, Heat Recovery Temperature Delta from January 2005 through March 2006

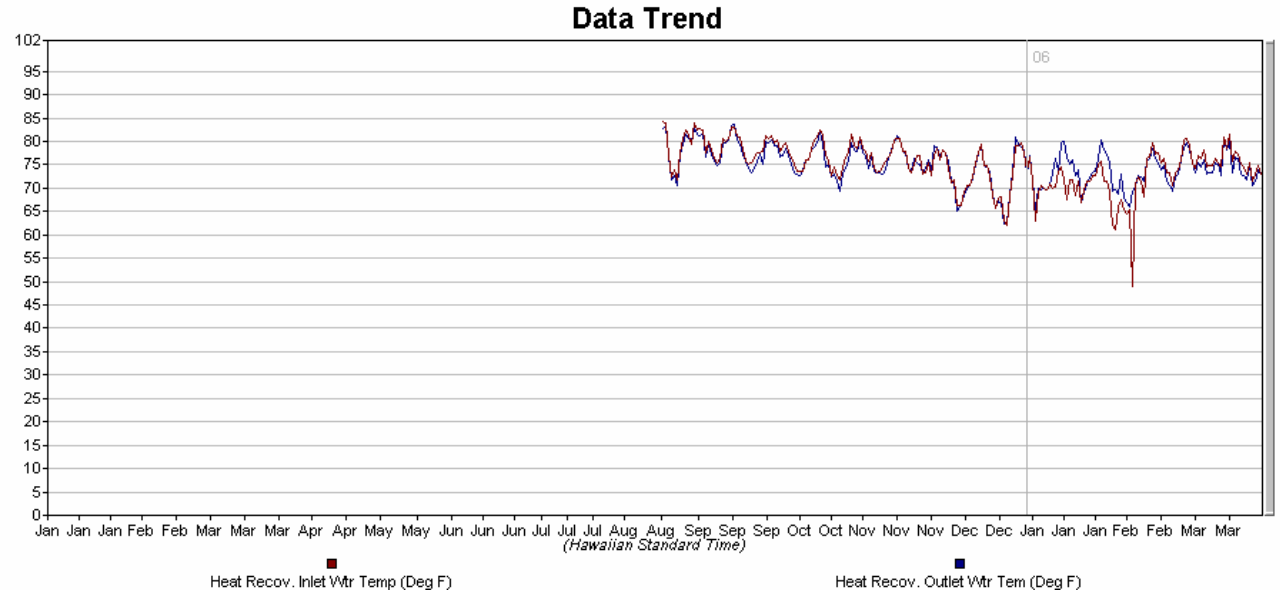


Figure 12, AC Output Power in kW from January 2005 through March 2006

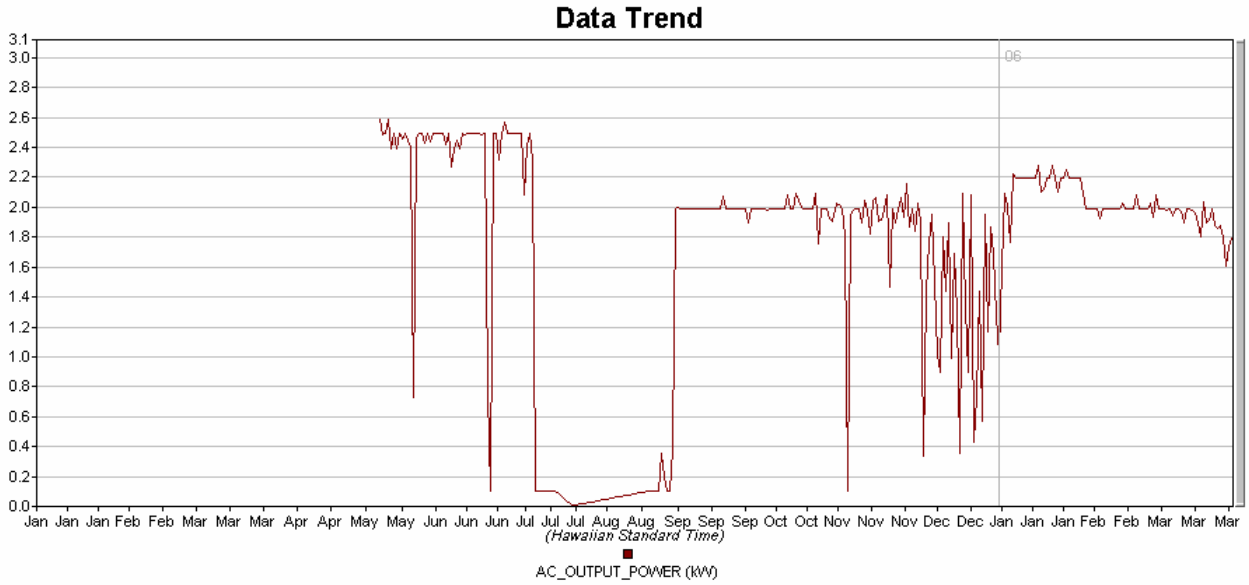
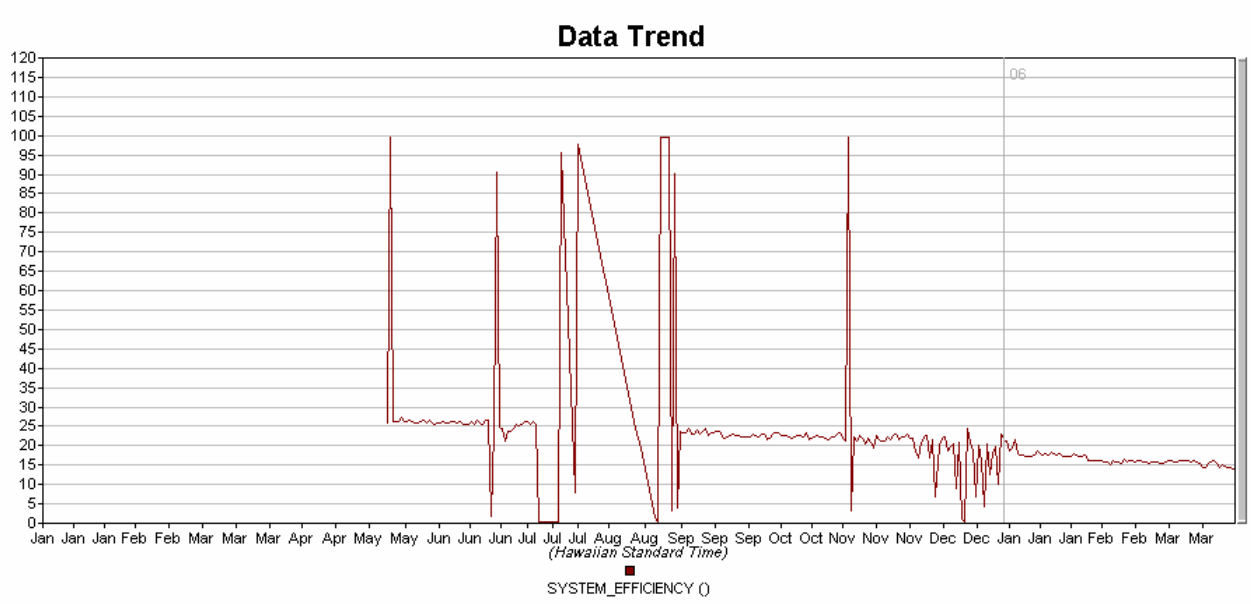


Figure 13, Overall System Efficiency (%) from January 2005 through March 2006



Schofield Barracks

Hawaii

	Jan-05	Feb-05	Mar-05	Apl-05	May-05	Jun-05	Jul-05	Aug-05	Sept-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06
Run Time (Hours)	720	672	744	720	739	454	210	83	720	744	685	744	740	672	744
Time in Period (Hours)	720	672	744	720	744	720	744	744	720	744	720	744	740	672	744
Availability (%)	100%	100%	100%	100%	99%	63%	28%	11%	100%	100%	95%	100%	99%	100%	100%
Energy Produced (kWe-hrs AC)	1765.3	1648.0	1833.0	1820.0	1817.0	1110.3	528.0	105.0	1788.0	1491.0	1356.0	1120.0	1556.0	1347.5	1433.0
Output Setting (kW)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Average Output (kW)	2.45	2.45	2.46	2.53	2.46	2.45	2.51	1.27	2.48	2.00	1.98	1.51	2.10	2.01	1.93
Capacity Factor (%)	49.04%	49.05%	49.27%	50.56%	48.84%	30.84%	14.19%	2.82%	49.67%	40.08%	37.67%	30.11%	41.83%	40.10%	38.52%
Fuel Usage, LHV (kWe-hrs AC)	6861	6414	7370	7461	7227	4472	3240	444	7554	6708	6321	7786	9093	8500	9410
Fuel Usage, LHV (BTUs)	2.34E+07	2.19E+07	2.51E+07	2.55E+07	2.47E+07	1.53E+07	1.11E+07	1.51E+07	2.58E+07	2.29E+07	2.16E+07	2.66E+07	3.10E+07	2.90E+07	3.21E+07
Fuel Usage (SCF)	23143	21635	24860	25167	24377	15085	10929	1498	25480	22627	21321	26263	30672	28671	31741
Electrical Efficiency (%)	25.74%	25.71%	24.89%	24.41%	25.16%	24.84%	16.31%	23.66%	23.68%	22.24%	21.46%	14.39%	17.12%	15.86%	15.24%
Thermal Heat Recovery (BTUs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heat Recovery Rate (BTUs/hour)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thermal Efficiency (%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Overall Efficiency (%)	25.74%	25.71%	24.89%	24.41%	25.16%	24.84%	16.31%	23.66%	23.68%	22.24%	21.46%	14.39%	17.12%	15.86%	15.24%
Number of Scheduled Outages	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Scheduled Outage Hours	0	0	0	0	5	0	0	0	0	0	35	0	0	0	0
Number of Unscheduled 0Outages	1	1	0	1	1	1	1	0	2	1	2	1	1	0	0
Unscheduled Outage Hours	0	0	0	0	0	266	534	661	0	0	0	0	4	0	0

2. Daily Work Logs

LOGANEnergy Field Technicians

September '04 – July '05

LOGANEnergy Corp.					
Monthly Site Report					
Period	September-04				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Collard	9/07/2004	247	Drive to Los Angeles		
Collard	9/09/2004	247	Visit and evaluate the Kaneohe Bay and Schofield Barracks site.		
Collard	9/10/2004	247	Meet with Hawaii Electric and revisit Pearl and Kaneohe Bay.		
Collard	9/11/2004	247	Fly home. Drive LA to Twenty-nine Palms		

LOGANEnergy Corp.					
Monthly Site Report					
Period	November-04				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Harvell	11/17/2004	247	Contractors started yesterday. Heliodyne was installed and the thermal loop was terminated on both ends. Electrical will be worked on today, along with an above ground gas line. Electric meter should be here, so I'll try to get that installed. CE box was hung and has power. Internal connections have not been made. Phone line has been connected. They should be done tomorrow. I should be close to being done. I will be flying out tomorrow night. Michael and I agree that all three machines can be running by time he leaves if the cable issues can be worked out at Kaneohe (which is waiting on the cable people to come out), and Schofield.		
Harvell	11/18/2004	247	The contractors will finish up at Schofield Thursday also. There are a lot of pulse wire & mini-meter connections still to be made, 42 I think. I will begin tackling that in the morning. Michael may come and help after he gets the bollards installed at Pearl. The phone and cable is installed. I think this unit will be ready to start by end of day Friday also. If Kevin (Pearl) doesn't push to get his phone line, Keith (Schofield) may have the coveted honor of being the first running fuel cell in Hawaii.		
Harvell	11/23/2004	247	Completed most of the installation on the 3 Hawaii units. Worked to place units on their pads, gather all the parts needed for all 3 units; gave oversight to contractors at Kaneohe and Schofield; ran control wires, DI lines, CAT5 and phone lines, installed iSTEC, mini-meter, DI panels, Connected Energy cabinets, stacks, and pulse wires. Arranged for communications, made multiple trips to buy supplies, made multiple trips to all 3 bases locating and picking up supplies as they were shipped in, coordinated propane tank placements and filling.		

LOGANEnergy Corp.					
Monthly Site Report					
Period	December-04				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Collard	12/10/2004	247			
			I re-flashed the new soft ware ver. 1.31. Started the fuel cell and it ran a little longer than before. I restarted and it ran all the way into Stack health 2. It then shut down for High Stack Coolant temp. I restarted and the fuel cell did the same thing as before O2_C4_High. No time to restart today.	32	8
Collard	12/13/2004	247	Started fuel cell and it shut down for the same reason as before. Restarted and had the same results. I did a third start and the fuel cell started fine, no issues. Tested the Heat Recovery system. It works great in the manual mode. Steve will work on the auto mode later if necessary. I called Lee at The Gas Co. to get a gas analysis of the Pearl and Schofield gas. I had to leave a message on both office and cell phones. The fuel cell is running at 2.5 Kw. Leaving site.		5
Collard	12/15/2004	247	SARC would not answer when called. It would complete a good modem check.	18	2.50
Collard	12/16/2004	247	Removed and replaced the SARC board. Re-installed the data. Boeard came with Ver 1.31 software installed.	16	2.5

LOGANEnergy Corp.					
Monthly Site Report					
Period	January-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
	1/2/2005	247			
			1104652779,1/2/2005 2:59:39 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
			1104672101,1/2/2005 8:21:41 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	1/4/2005	247	1104818943,1/4/2005 1:09:03 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	1/19/2005	247	1106195689,1/19/2005 11:34:49 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	1/26/2005	247	1106755844,1/26/2005 11:10:44 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		

LOGANEnergy Corp.					
Monthly Site Report					
Period	Feburary-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
	2/1/2005	247	1107238843,2/1/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/2/2005	247	1107325243,2/2/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/3/2005	247	1107411643,2/3/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/4/2005	247	1107498043,2/4/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/5/2005	247	1107584443,2/5/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/6/2005	247	1107670843,2/6/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/7/2005	247	1107757243,2/7/2005 1:20:43 AM,Running (51)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
	2/13/2005	247	1108296367,2/13/2005 7:06:07 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		

LOGANEnergy Corp.					
Monthly Site Report					
Period	March-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
	3/7/2005	247	1110253223,3/7/2005 10:40:23 PM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	3/10/2005	247	1110447427,3/10/2005 4:37:07 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	3/14/2005	247	1110857345,3/14/2005 10:29:05 PM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	3/25/2005	247	1111746153,3/25/2005 5:22:33 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	3/26/2005	247	1111824952,3/26/2005 3:15:52 AM,Running (51)ALERT, LOW_CELL_TRIP_ALERT, Error Code: (500)(0)		
	3/28/2005	247	1112051556,3/28/2005 6:12:36 PM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	3/29/2005	247			
			1112130890,3/29/2005 4:14:50 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
			1112143444,3/29/2005 7:44:04 PM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	3/31/2005	247			
			1112277845,3/31/2005 9:04:05 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
			1112306635,3/31/2005 5:03:55 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		

LOGANEnergy Corp.					
Monthly Site Report					
Period	April-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
	4/1/2005	247	1112370819,4/1/2005 10:53:39 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	4/2/2005	247			
			1112418305,4/2/2005 12:05:05 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
			1112441133,4/2/2005 6:25:33 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	4/3/2005	247			
			1112504788,4/3/2005 12:06:28 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
			1112511378,4/3/2005 1:56:18 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	4/4/2005	247	1112636295,4/4/2005 1:38:15 PM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
	4/5/2005	247			
			1112673879,4/5/2005 12:04:39 AM,Running (51)ALERT, H2_STOICH_HIGH, Error Code: (520)(0)		
			1112728263,4/5/2005 3:11:03 PM,Unknown (100)ALERT, REMOTE_REQUESTED_SHUTDOWN, Error Code: (600)(0)		
			1112728264,4/5/2005 3:11:04 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1112728644,4/5/2005 3:17:24 PM,Shutdown Complete (105)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732112,4/5/2005 4:15:12 PM,Shutdown Complete (105)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732117,4/5/2005 4:15:17 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
			1112732125,4/5/2005 4:15:25 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732257,4/5/2005 4:17:37 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732441,4/5/2005 4:20:41 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732451,4/5/2005 4:20:51 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732461,4/5/2005 4:21:01 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732481,4/5/2005 4:21:21 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732492,4/5/2005 4:21:32 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732493,4/5/2005 4:21:33 PM,Unknown (101)ALERT,		

			REMOTE_REQUESTED_SHUTDOWN, Error Code: (600)(0)		
			1112732493,4/5/2005 4:21:33 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1112732511,4/5/2005 4:21:51 PM,SD Ref Cool (104)SHUTDOWN, LOSS_ATO_BLOWER, Error Code: (546)(0)		
			1112732645,4/5/2005 4:24:05 PM,Shutdown Complete (105)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732655,4/5/2005 4:24:15 PM,Shutdown Complete (105)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732665,4/5/2005 4:24:25 PM,Shutdown Complete (105)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112732668,4/5/2005 4:24:28 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
			1112732678,4/5/2005 4:24:38 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733045,4/5/2005 4:30:45 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733065,4/5/2005 4:31:05 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733341,4/5/2005 4:35:41 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733443,4/5/2005 4:37:23 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733483,4/5/2005 4:38:03 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112733667,4/5/2005 4:41:07 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112734809,4/5/2005 5:00:09 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112734820,4/5/2005 5:00:20 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112735115,4/5/2005 5:05:15 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112735126,4/5/2005 5:05:26 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112735136,4/5/2005 5:05:36 PM,Reformer Purge (31)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112736415,4/5/2005 5:26:55 PM,Reformer Warmup (32)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	4/6/2005	247			
			1112760005,4/6/2005 12:00:05 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112782058,4/6/2005 6:07:38 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112782068,4/6/2005 6:07:48 AM,Running (51)ESTOP,		

			HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112782078,4/6/2005 6:07:58 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112782180,4/6/2005 6:09:40 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112787892,4/6/2005 7:44:52 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		
			1112787912,4/6/2005 7:45:12 AM,Running (51)ESTOP, HW_ESTOP_FS7_PRES2_FS9_L3, Error Code: (629)(0)		

LOGANEnergy Corp.					
Monthly Site Report					
Period	May-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
	5/3/2005	247	1115171582,5/3/2005 9:53:02 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	5/4/2005	247	1115230736,5/4/2005 2:18:56 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	5/5/2005		1115330279,5/5/2005 5:57:59 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	5/7/2005	247			
			1115473650,5/7/2005 9:47:30 AM,Unknown (100)ALERT, REMOTE_REQUESTED_SHUTDOWN, Error Code: (600)(0)		
			1115473650,5/7/2005 9:47:30 AM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1115475610,5/7/2005 10:20:10 AM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
	5/11/2005	247			
			1115845876,5/11/2005 5:11:16 PM,Running (51)SHUTDOWN, LEVS5_HUMID_LOW_SD, Error Code: (377)(0)		
			1115845876,5/11/2005 5:11:16 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1115845996,5/11/2005 5:13:16 PM,Shutdown Complete (105)ALERT, AUTO_RESTART, Error Code: (603)(0)		
			1115845999,5/11/2005 5:13:19 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
			1115847824,5/11/2005 5:43:44 PM,Unknown (100)ALERT, REMOTE_REQUESTED_SHUTDOWN, Error Code: (600)(0)		
			1115847824,5/11/2005 5:43:44 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1115847871,5/11/2005 5:44:31 PM,Power Down (200)ALERT, REMOTE_REQUESTED_ESTOP, Error Code: (601)(0)		
			1115848416,5/11/2005 5:53:36 PM,Power Down (200)ALERT, REMOTE_REQUESTED_ESTOP, Error Code: (601)(0)		
			1115848986,5/11/2005 6:03:06 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		

	5/13/2005	247			
			1115990940,5/13/2005 9:29:00 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
			1115992205,5/13/2005 9:50:05 AM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1115992536,5/13/2005 9:55:36 AM,ESTOP (107)ESTOP, HW_ESTOP_SARC_L0, Error Code: (534)(0)		
			1115993220,5/13/2005 10:07:00 AM,ESTOP (107)ESTOP, HW_ESTOP_SARC_L0, Error Code: (534)(0)		
			1115993372,5/13/2005 10:09:32 AM,Manual (20)SHUTDOWN, I2C_PDC_2_COMM, Error Code: (109)(-32768)		
			1115993715,5/13/2005 10:15:15 AM,Manual (20)ALERT, ABORT_DATA_TRANSFER, Error Code: (131)(0)		
			1115995379,5/13/2005 10:42:59 AM,ESTOP (107)ESTOP, HW_ESTOP_SARC_L0, Error Code: (534)(0)		
			1116007803,5/13/2005 2:10:03 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
			1116009287,5/13/2005 2:34:47 PM,Reformer Warmup (32)SHUTDOWN, O2_CH4_HIGH_SD, Error Code: (512)(0)		
			1116009287,5/13/2005 2:34:47 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
Butala	5/31/2005	247			
			Changed desulfur can and internal DI filter		4
			Charlie Senning at the Gas Co. having propane tested.		1
			Interface would not come up. Per instructions from Plug Tech support, modem probably locked up. Shut down, de-powered and restarted. Interface still would not come up. Restarted unit remotely from home phone.		6
			Worked on internet connection. Worked on CE and meter wiring. Couldn't get thru router.		7

LOGANEnergy Corp.					
Monthly Site Report					
Period	June-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Butala	6/1/2005	247			
			Installed power supply, resistor, and wiring.		5
			Worked on internet connection. Got connected to LAN. Still couldn't get thru router.		7
			Finally got thru router. Data sending and receiving but intermittently.		4
			Installed bollard and cap, painted bollards.		2
			Changed out Omega meter to ISTEC meter. Wired up to CE box. Per Mark Ginther from CE, he was seeing all of the data points. Plumber re-plumbed CHP piping.		7
	6/3/2005	247			
			1117840186,6/3/2005 7:09:46 PM,Running (51)SHUTDOWN,		

			O2_CH4_HIGH_SD, Error Code: (512)(0)		
			1117840186,6/3/2005 7:09:46 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1117840306,6/3/2005 7:11:46 PM,Shutdown Complete (105)ALERT, AUTO_RESTART, Error Code: (603)(0)		
			1117840308,6/3/2005 7:11:48 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
	6/4/2005	247	1117925083,6/4/2005 6:44:43 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/5/2005	247	1118028210,6/5/2005 11:23:30 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/6/2005	247	1118032160,6/6/2005 12:29:20 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/7/2005	247	1118200557,6/7/2005 11:15:57 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/12/2005	247	1118621415,6/12/2005 8:10:15 PM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/13/2005	247	1118636209,6/13/2005 12:16:49 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/15/2005	247			
			1118845671,6/15/2005 10:27:51 AM,Running (51)SHUTDOWN, LEVS5_HUMID_LOW_SD, Error Code: (377)(0)		
			1118845671,6/15/2005 10:27:51 AM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1118845791,6/15/2005 10:29:51 AM,Shutdown Complete (105)ALERT, AUTO_RESTART, Error Code: (603)(0)		
			1118845794,6/15/2005 10:29:54 AM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
	6/16/2005	247	1118895720,6/16/2005 12:22:00 AM,Running (51)ALERT, I2C_GET_ANALOG_COMM, Error Code: (111)(-32768)		
	6/20/2005	247			
			1119306272,6/20/2005 6:24:32 PM,Running (51)SHUTDOWN, LEVS5_HUMID_LOW_SD, Error Code: (377)(0)		
			1119306272,6/20/2005 6:24:32 PM,SD Ref Cool (104)EVENT, SHUTDOWN_EVENT, Error Code: (1001)(0)		
			1119306393,6/20/2005 6:26:33 PM,Shutdown Complete (105)ALERT, AUTO_RESTART, Error Code: (603)(0)		
			1119306396,6/20/2005 6:26:36 PM,Reformer Purge (31)EVENT, STARTUP_EVENT, Error Code: (1000)(0)		
			1119311728,6/20/2005 7:55:28 PM,Reformer Warmup (32)SHUTDOWN, O2_CH4_HIGH_SD, Error Code: (512)(0)		

LOGANEnergy Corp.					
Monthly Site Report					
Period	July-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Butala	7/8/2005	247			
			Changed name and stack no. on interface.		1
			Checked phone line and phone line polarity - good. Checked all connections - good. Replaced SARC board. Still no local or remote communication. Troubleshot CE system w/ and Roylance. Sending all Plug data, per Mark Ginther, but only sending fuel consumption, not kW or BTU. Checked wiring - good. Don't know why kW and BTU info not being sent.		5
			Changed out carbon and RO filters		1
			Changed out mixed bed filter. Purged RO filter.		3

LOGANEnergy Corp.					
Monthly Site Report					
Period	September-05				
Site	Schofield Barracks				
Engineer	**Date**	**PP S/N**	**Activity**	**Mileage**	**Hours**
Butala	9/1/2005	247			
			Downloaded inverter.rom file. Started the unit. About an hour later the unit shut down on low gas.		3
			Checked gas lines/vlv - ok. Cleaned electrical cabinet filter. Restarted. Later that day unit shut down on 02 CH4 High		3
			Checked stepper motor - trave = 1/4" so ok. Replaced electrical cabinet filter. Unit shut down later on 02 CH4 High. Plug was able to start and tweak the unit the next day (8/31/05) and it is now running.		3.5
			I was unable to get local or remote comms.		3
			Jan from Plug Power helped me trouble-shoot comms. Jumped K1 relay, etc. Jan thinks it's the DB9 cable.		4
			Replaced DB9 cable, no effect. Noticed that the interface ribbon was fried.		2
			Replaced interface ribbon. Phone # to Plug was wrong - changed #. Started system. Later in the day system shut down. I restarted. Later couldn't get remote comms		3
			Restarted unit, no error messages came up saying why system shutdown. Could not get modem test to pass.		1